Gleason honored with Alvin Van Valkenburg Award

October 5, 2016

Arianna Gleason of the Laboratory's Shock and Detonation Physics group recently received the Alvin Van Valkenburg Award at the 2016 Gordon Research Conference on High Pressure in Holderness, NH. Gleason was honored for her substantial contributions as an early career scientist to high-pressure physics in both static and dynamic compression. She presented a talk on “Ultrafast X-ray Studies on the Dynamics of Transitions in Geophysical Materials” after accepting the award.

Gleason’s achievements

Gleason’s research has focused on the strength of iron at planetary core conditions. She used radial x-ray diffraction to investigate the strength of iron at high pressure in a diamond anvil cell under static compression. This study provided high fidelity measurements of iron’s strength. Extrapolation to conditions of the Earth’s center suggests that the core is much weaker that previously expected. Gleason has extended

her research from static compression into the regime of dynamic compression. She has performed an experiment using x-ray diffraction at the Linac Coherent Light Source at the SLAC National Accelerator Laboratory to probe the strength of iron at both high pressure and high temperature using laser-driven shock compression.

Gleason began conducting scientific research in 1998 on asteroid/comet detection and discovery with the group Spacewatch at the University of Arizona. She received a doctorate from the University of California, Berkeley in mineral physics and Earth sciences for her investigation of the elasticity and plasticity of Earth-relevant materials at extreme conditions. Gleason used static compression techniques combined with synchrotron sources. The work helps interpret Earth's seismic information and provides insight into the evolution of the Earth's interior. She joined the Laboratory in 2014 as a Postdoctoral Fellow, and received the Reines Distinguished Postdoctoral Fellow in 2015. Cindy Bolme (M-9) and Professor Wendy Mao (Stanford University) co-mentor her. The American Geophysical Union has presented Gleason with the Early Career Award in Mineral and Rock Physics. *Nature Geoscience* and *Nature Communications* have published her research.

About the Alvin Van Valkenburg Award

The Research at High Pressure Conference is one of the oldest Gordon Research Conferences and has existed continuously for over 60 years. High pressure provides the largest range of any tunable thermodynamic variable to change and study material properties. The conference presents the Alvin Van Valkenburg Award to honor an early career scientist who shows great promise to further the field of high pressure. Alvin Van Valkenburg invented the diamond anvil cell and was a pioneer in high pressure research.

In the photo below, Gleason is shown making final adjustments to detector positions inside the Matter in Extreme Conditions (MEC) target chamber at the Stanford Liner Accelerator facility (SLAC) in California.